CLAIMS

1. A gene targeting vector for introducing an exogenous gene into the ZO-1 gene region in a non-human animal, wherein the vector comprises the exogenous gene and an entire or partial region of the ZO-1 gene.

2. The vector of claim 1, comprising a structure in which the entire or partial region of the ZO-1 gene is placed upstream and/or downstream of the exogenous gene.

3. The vector of claim 2, wherein the partial region of the ZO-1 gene comprises exon II or a portion thereof.

4. The vector of claim 3, comprising a structure in which either one of the DNA fragments in (a) and (b) below is placed at each side of the exogenous gene:

(a) a 1.5 kb Bsp1286I-Bsp1286I fragment comprising a partial exon II of the ZO-1 gene and its upstream, and an 8.5 kb PstI-BamHI fragment located downstream of exon II;

(b) a 5.1 kb PstI-BsrDI fragment comprising a partial exon II of the ZO-1 gene and its upstream, and a 3.9 kb PstI-SphI fragment located downstream of exon II.

5. A gene targeting vector for introducing an exogenous gene into the ZO-2 gene region or the Disabled-2 gene region of a non-human animal, wherein the vector comprises the exogenous gene and an entire or partial region of the ZO-2 gene or the Disabled-2 gene.

6. The vector of claim 5, wherein the vector comprises a structure in which an entire or partial region of the ZO-2 gene or the Disabled-2 gene is placed upstream and/or downstream of the exogenous gene.

7. The vector of any one of claims 1 to 6, wherein the vector is used for generating a non-human animal expressing an exogenous gene or a non-human animal cell expressing an exogenous gene.

8. The vector of any one of claims 1 to 7, wherein the vector comprises in the upstream of an exogenous gene a promoter capable of transcribing the exogenous gene.

9. The vector of any one of claims 1 to 8, wherein the vector further comprises a marker gene expression cassette.

10. The vector of claim 9, wherein the vector comprises a structure in which an exogenous gene is placed adjacent to the downstream of a marker gene expression cassette.

11. The vector of any one of claims 1 to 6, wherein the exogenous gene is a marker gene expression cassette.

12. The vector of any one of claims 9 to 11, wherein the marker gene expression cassette is a drug resistance gene expression cassette.

13. The vector of claim 12, wherein the drug resistance gene expression cassette is a DNA fragment comprising β-geo.

14. The vector of any one of claims 1 to 13, wherein the non-human animal is a mouse.

15. A method for epithelial cell gene targeting, wherein the method comprises introducing a targeting vector into the cell by electroporation under the conditions of 0.4 to 0.5 kV voltage and 125 to 250 μF condenser capacity.

16. The method of claim 15, wherein calcium concentration in a prepared cell solution used for electroporation is 5 μM or less.

17. The method of claim 15 or 16, wherein the targeting vector targets the ZO-1 gene, the ZO-2 gene, or the Disabled-2 gene on cellular chromosome.

18. The method of claim 15 or 16, wherein the targeting vector is any one of claims 1 to 13.

19. The method of any one of claims 15 to 18, wherein the epithelial cell is derived from a higher animal cell.

20. The method of claim 19, wherein the higher animal is a mouse.

21. The method of claim 20, wherein the cell is the EpH4 mouse epithelial cell line.

22. A method for producing an epithelial cell line having an artificially altered chromosome, wherein the method comprises introducing a targeting vector into an epithelial cell line by the

gene targeting method of any one of claims 15 to 21.